MUXserver
Software Installation Guide
OpenVMS

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Preface

Purpose of the Guide

This document describes:

- Installing MUXserver LAT/TELNET Remote Terminal Server distribution software onto a OpenVMS system running DECnet Phase IV or DECnet /OSI Phase V so that this system can then perform as a load host.
- Configuring the load host's DECnet databases.
- Verifying the installation by:
  * Downloading the server image to the MUXserver LAT/Telnet Remote Terminal Server, and then
  * Testing a number of representative server commands.

This guide is applicable to Version 2.0 of the MUXserver product and all subsequent maintenance releases up to the next major product release. It is intended for system or network managers who are responsible for installing MUXserver software on OpenVMS systems.

Readers should be familiar with both DECnet network management concepts and the OpenVMS Operating System.

The Guide is organized as follows:

Chapter 1	Briefly introduces the MUXserver Remote Terminal Network and summarizes the MUXserver installation, configuration, and verification procedures.
Chapter 2	Describes the preparation for installation and the actual installation of MUXserver distribution software.
Chapter 3	Describes the configuration of the load host's DECnet databases to support the MUXserver product.

Chapter 4	Describes the verification of the MUXserver software installation by: • Downline loading the server image, and • Testing a number of representative commands via the MUXserver product's supervisor port.
Appendix A	Lists the files provided in the MUXserver Distribution Kit.
Glossary	Defines abbreviations and special terms used in this guide.
Index	Provides a page reference to important topics used in this guide.

Other MUXserver Publications

The following is a list of related MUXserver publications:

- *MUXserver Network Reference Manual* AA-PESEB-TE
  Describes procedures for setting-up, managing, monitoring, and troubleshooting the MUXserver Network.
- *MUXserver 90 Hardware Installation Manual* EK-DSRZF-IM
  Describes installation and maintenance of the MUXserver 90 hardware.
- *MUXserver 320 Hardware Installation Manual* EK-DSRZE-IM
  Describes installation and maintenance of the MUXserver 320 hardware.
- *MUXserver 380 Hardware Installation Manual* EK-DSRZD-IM
  Describes installation and maintenance of the MUXserver 380 hardware.
- *MUXserver Network Identification Card* EK-DSRZD-IC
  A means of recording MUXserver identification information.
- *MUXserver Software Product Description* AE-PESGB-TE
  Describes the MUXserver's software and its operation.
- *MUXserver System Support Addendum* AE-PESHB-TE
  An addendum to the *MUXserver Software Product Description* which describes the various systems supported by the MUXserver 90, 320 and 380.

Other Relevant Publications

Reference to the following Digital publications may be required during installation of the MUXserver software:

- *DECnet for OpenVMS Guide to Networking*
  Provides an overview of DECnet networking capabilities helpful to new users of DECnet for OpenVMS and experienced users not accustomed to a networking environment.

- *DECnet for OpenVMS Networking Manual*
  Provides concept and use information for system and network managers and for DECnet for OpenVMS users and programmers.
- *DECnet for OpenVMS Network Management Utilities*
  Describes how to use the Network Control Program (NCP) utility. Also includes information for testing the network using DECnet Test Sender /Receiver commands.

Conventions

The following conventions apply throughout this guide:

Numbers

- All numbers are in decimal unless otherwise noted.
- All Ethernet addresses are in hexadecimal.

Graphics

Normal	Normal type indicates an example of system output.
Bold	Bold type indicates an example of user input.
Italics	Indicates a variable.
key	Indicates a specific key to be pressed.
CTRL/*x*	Indicates that the CTRL key should be held down while the key, specified by *x*, is also pressed.

1
Introduction

1.1 The MUXserver Network

The MUXserver Remote Terminal Server Network connects remote terminals (or other asynchronous port devices) to an Ethernet Local Area Network (LAN).

Each network includes one MUXserver, usually connected remotely to one or more DECmux 300 multiplexers and via them, to asynchronous devices such as terminals or printers. The MUXserver 90, MUXserver 320 and MUXserver 380 are separate products which support different numbers of remote asynchronous devices via synchronous links as follows:

MUXserver 90

- One synchronous link may be connected, via modem, to the MUXserver 90.
- Up to three remote asynchronous device multiplexers (DECmux 300s) may be connected in a daisy-chain fashion, via modems, to the sole synchronous link.
- Depending on its particular model and configuration, each DECmux 300 may have 8, 16, 24 or 32 asynchronous ports. The total MUXserver 90 Network is limited to 96 active devices at any one time.

MUXserver 320

- Up to two synchronous links may be connected, via modems, to the MUXserver 320.
- Up to three remote asynchronous device multiplexers (DECmux 300s) may be connected, via modems, in a daisy-chain fashion to **each** synchronous link. A MUXserver 320 Network is limited to six DECmux 300, and depending on its particular model and configuration, each DECmux 300 may have 8, 16, 24 or 32 asynchronous ports. However, the total MUXserver 320 Network is limited to 32 active devices at any one time.

MUXserver 380

- Up to eight synchronous links may be connected, via modems, to the MUXserver 380.
- Up to three remote asynchronous device multiplexers (DECmux 300s) may be connected, via modems, in a daisy-chain fashion to **each** synchronous link. However, the total MUXserver 380 network is limited to sixteen DECmux 300s, and the total MUXserver 380 Network is limited to 128 active terminals at any one time.

The network connects each remote terminal to the LAN with access to LAT services and INTERNET hosts.

1.2 Software Installation Activities

1.2.1 Overview

The MUXserver software includes the files in the MUXserver Distribution Kit.

Software installation involves:

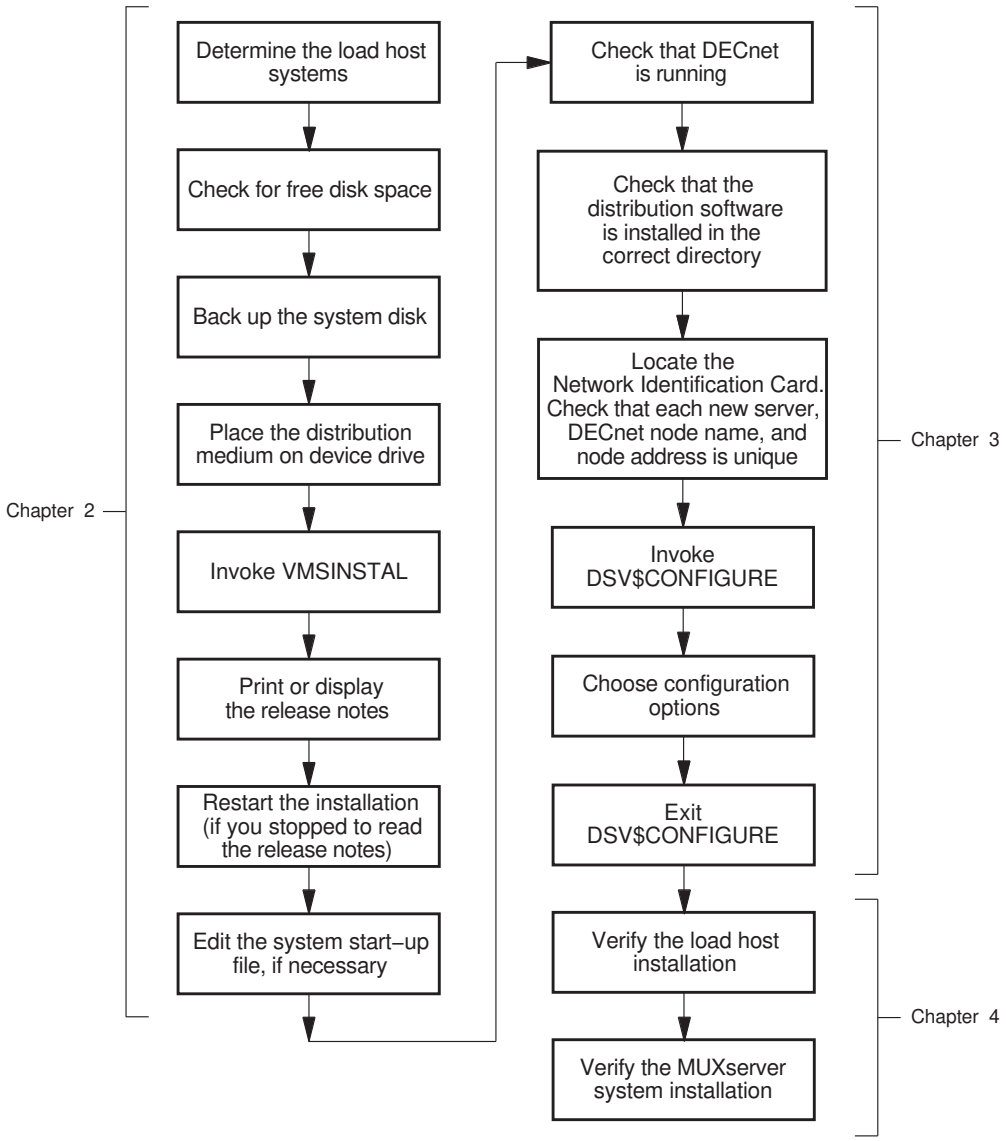
- Installing the MUXserver distribution software,
- Configuring the load host node database,
- Verifying the load host installation by downline loading the server image, and
- Verifying the server system installation by testing a selection of representative server commands.

Figure 1–1 is a flow chart of the software installation process. The steps in the flow chart serve as an overview of installing the distribution software and configuring the load host node database.

Software installation establishes an OpenVMS system as a load host for one or more MUXserver networks. A **load host** is a system that contains the server image and whose node database has entries for specific servers. This allows it to downline load the server image to servers on the local Ethernet. In addition, a load host performs maintenance activities such as receiving upline dumps from the server.

A load host can be a single OpenVMS system or can be a member node of a cluster. To act as a load host, an OpenVMS system must be running DECnet Phase IV or DECnet/OSI Phase V and must be located on the same Ethernet as the MUXserver(s).

Figure 1–1 Flowchart of Software Installation Activities



Digital Equipment Corporation suggests that:

- At least two load hosts be assigned for each MUXserver (or other server), and
- At least one load host be assigned for every ten servers, although more servers can be supported in many cases, depending on the load host's capabilities.

Providing alternate load hosts reduces the MUXserver Network's dependence on one particular load host. If the primary load host is unavailable, another system can downline load the server and receive upline dumps from it. The MUXserver should have these load-host functions available at all times. In addition, assigning more than one load host for every ten servers reduces the demand on any single load host's resources.

Any Digital system that has a MUXserver Distribution Kit available can be used as an alternate load host. MUXserver Software Distribution Kits are available for the following systems:

- OpenVMS (installation is described in this guide),
- ULTRIX (refer to the *MUXserver Software Installation Guide (ULTRIX)*), and
- OSF/1 (refer to the *MUXserver Software Installation Guide (OSF/1)*).

1.2.2 Coordination with Hardware Installation

MUXserver software installation should be coordinated with the installation of the local and remote hardware. Chapter 4 describes the coordination required between hardware and software installation.

1.2.3 Installing Distribution Software

MUXserver distribution software is installed onto an OpenVMS system using an automated procedure called VMSINSTAL. The MUXserver Software Distribution Kit includes a procedure file which is used by VMSINSTAL to perform the installation. When run, VMSINSTAL:

- Creates an appropriate directory on the load host for the software files,
- Copies the files from the distribution media to the load host, and
- Optionally prints the MUXserver release notes.

Installation of distribution software is described in Chapter 2.

1.2.4 Configuring the Load Host Node Database

When distribution software has been installed onto an OpenVMS system (node), its MOP client database needs to be configured to support the new MUXserver network.

The node database is configured with an automated procedure included in the MUXserver Software Distribution Kit, DSV$CONFIGURE.COM.

Previous versions of the MUXserver software included a command procedure called DSVCONFIG.COM, which stored information about MUXservers and DECservers in an external file, DSVCONFIG.DAT. During the installation of the software, you will be asked if you wish to convert your DSVCONFIG.DAT database for use with the new utility.

1.2.5 Verifying the Installation

1.2.5.1 Verifying the Load Host Installation

Verifying a load host installation involves downline loading the server image to a server. This ensures that the host:

- Has the appropriate files in the correct directory,
- Has a correct entry in its node database for the test server, and
- Can successfully downline load the server image.

1.2.5.2 Verifying the MUXserver Installation

Verifying a complete MUXserver installation involves the testing of a number of MUXserver commands at an interactive terminal connected to a MUXserver port. This ensures that:

- The correct version of the software is in the MUXserver,
- The MUXserver hardware operates with the new software, and
- The new software is running correctly.

2
Installing Distribution Software

This chapter describes the installation of the MUXserver distribution software onto an OpenVMS load host using the OpenVMS operating system's VMSINSTAL command.

VMSINSTAL is an automated procedure that:

- Creates a directory called SYS$COMMON:[DECSERVER] on the load host,
- Copies the files from the distribution media into this directory, and
- Optionally prints a copy of the release notes.

Installation will take about five minutes.

2.1 Preparing to Run the Installation Procedure

Before running the installation procedure:

- Determine which systems are to be load hosts for the server. The distribution software must be installed onto all load hosts.
- Check that each load host has free disk space for downline loading the server image as specified in the following table. If installing for multiple types of MUXserver, add the requirements together, including the mandatory overhead allowance once only.

Installing	Required Disk Space †
Any MUXserver	600 blocks (mandatory) Overhead
MUXserver 90	Overhead plus 7,200 blocks
MUXserver 320	Overhead (see above) plus 3,100 blocks
MUXserver 380	Overhead plus 5,200 blocks

†If all subsets are to be installed, 16,100 blocks of disk space will be required.

- Check that DECnet Phase IV or DECnet/OSI Phase V is running and is in the ON state. For information on DECnet, refer to the *DECnet for OpenVMS Networking Manual*.

2.2 Software Prerequisites

Configuration of MUXserver distribution software Version 2.0 or later, using the configuration procedure DSV$CONFIGURE.COM requires:

- DECnet Phase IV or DECnet/OSI Phase V, and
- OpenVMS Operating System for VAX V5.2 or later, or OpenVMS for Alpha AXP V1.0 or later.

Installation of MUXserver distribution software Version 2.0 is possible with VMS Operating System Versions V5.0-x and V5.1-x, but network configuration cannot be performed by using DSV$CONFIGURE.COM. Configuration with these operating system versions requires use of the earlier installation procedure, DSVCONFIG.COM and any existing DSVCONFIG.DAT database. Contact your local Digital representative if you have problems with the latter process.

2.3 VMSINSTAL Conventions

VMSINSTAL is an interactive procedure. It displays a series of questions preceded by an asterisk (*). After a question the default response, if there is one, appears in brackets ([ ]). At the end of the display line either a colon (:) or a question mark (?) appears.

Type your response immediately after the colon or question mark and then press Return. To select the default response, press only Return.

If you need assistance with a question, enter a question mark (?) and then press Return as a response. VMSINSTAL will display explanatory text about the question and then repeat the question.

Refer to the OpenVMS documentation for a complete description of VMSINSTAL.

2.4 Running VMSINSTAL

1. Load the MUXserver software distribution medium into the appropriate device.
2. Log in to the system manager's account and enter the following commands:

   $**SET DEFAULT SYS$UPDATE** Return
   $**@VMSINSTAL MS380** ***device-identifier*** **OPTIONS N** Return

   where *device-identifier* is the device in which the distribution medium is loaded.

   Running the procedure with this command line is the only way to get the release notes printed automatically. If you run VMSINSTAL without these keywords - OPTIONS N - the release notes will not be mentioned and you will not be asked if you would like them printed.
3. VMSINSTAL then displays the procedure title, the date and time, and will ask:

   ```
   * Are you satisfied with the backup of your system disk [YES]?
   ```

   Press Return to answer YES, or take appropriate action.
4. If you are installing from the distribution media (not from copied savesets), you are prompted to mount the first volume by:

   ```
   Please mount the first volume of the set on device-identifier.
   * Are you ready?
   ```

   Press Y and press Return. A message will confirm that the medium is mounted.

   Installation continues with:

   ```
   The following products will be processed:
      MS380 Vn.n
   Beginning installation of MS380 Vn.n at hh:mm
   %VMSINSTAL-I-RESTORE, Restoring product saveset A...
   ```

   The MUXserver software version numbers are not specified in this Guide. For example, the release note file is shown as MS380$*nnn*.RELEASE_NOTES. Here, *nnn* represents the version number. If version 2.0 is being installed, the release notes file is MS380$020.RELEASE_NOTES.
5. The procedure now lists the following options for printing and displaying the release notes.

```
Release notes included with this kit are always copied to SYS$HELP.

Additional Release Notes Options:
  1.  Display release notes
  2.  Print release notes
  3.  Both 1 and 2
  4.  None of the above

* Select option [2]
```

Select one of these options. Digital recommends that you select Option 2 to print the release notes.

If you select Option 1, the following message is displayed:

```
VMI$ROOT:[SYSUPD.MS380nnn] MS380$nnn.RELEASE_NOTES;1
```

and the release notes will be immediately displayed on your terminal.

If you select Option 2, you are asked to queue the file for printing:

```
* Queue name [SYS$PRINT]:
```

To print the release notes on the default printer press Return or type the name of another print queue. A message will indicate that the file has been queued.

If you select Option 3, you are first asked to queue the file for printing:

```
* Queue name [SYS$PRINT]:
```

To print the release notes on the default printer press Return or type the name of another print queue. A message will indicate that the file has been queued. Next, the following message is displayed:

```
VMI$ROOT:[SYSUPD.MS380nnn] MS380$$nnn.RELEASE_NOTES;1
```

The release notes will immediately start scrolling on your terminal.

6. After all release notes have been displayed (if appropriate), VMSINSTAL will continue with:

```
* Do you want to continue the installation [N]?
```

   - Press either Y to continue without reading the release notes, or Return to stop the procedure, and read the release notes. The latter choice ends this initial installation session and allows you to check for any changes that may affect this installation. VMSINSTAL also places the release notes in the file MS380$*nnn*.RELEASE_NOTES in the SYS$HELP directory, even if you choose not to read them at this stage.

If you stop VMSINSTAL to read the release notes, run the procedure again when you are ready to continue. Enter:

```
$ @VMSINSTAL MS380 device-identifier
```

Return

where *device-identifier* is the device on which the distribution materials are mounted.

The new procedure will take you through Steps 3 and 4 outlined above, but will then immediately continue as in Step 7 and following steps below.

7. When you have chosen to continue without pausing to read the release notes, or have rerun the procedure after reading the notes, VMSINSTAL will continue with:

```
%VMSINSTAL_I_RELMOVED , The product's release notes have been moved to SYS$HELP
```

8. VMSINSTAL will then inquire which specific MUXserver products are to be installed:

```
* Do you wish to install the MUXserver 380 product [YES]?
```

If a MUXserver 380 is being installed, press Return. If a MUXserver 380 is not being installed, press N then Return.

```
* Do you wish to install the MUXserver 320 product [YES]?
```

If a MUXserver 320 is being installed, press Return. If a MUXserver 320 is not being installed, press N then Return.

A further choice is presented for installation of a MUXserver 90:

```
* Do you wish to install the MUXserver 90 product [YES]?
```

Similarly, if a MUXserver 90 is being installed, press Return. If a MUXserver 90 is not being installed, press N then Return.

9. VMSINSTAL will continue with:

```
* Do you want the installation procedure to convert your DSVCONFIG.DAT database
to the new format [YES]?
```

Press Enter to convert your database files if you have an older form of the database already on your system (see Section 1.2.4). Conversion time varies, depending on the number of entries in the DSVCONFIG.DAT database.

10. The installation process now asks about purging of old files:

```
* Do you want to purge files replaced by this installation [YES]?
```

Press Enter to purge previous versions of the files.

11. The next inquiry you have to answer is:

```
Do you want to run the IVP after the installation [Yes]?
```

Enter Return to allow the Installation Verification Procedure (IVP) to execute after the installation is complete.

Installation will take one to two minutes, as indicated in the message:

```
No more questions will be asked, the installation will take
one to two minutes.
```

12. VMSINSTAL then continues with the following message:

```
%VMSINSTAL-I-SYSDIR, This product creates system directory [DECSERVER].
```

This is typically then followed with a sequence of messages in this format:

```
%CREATE-I-EXISTS, VMI$COMMON:[DECSERVER] already exists
%VMSINSTAL-I-SYSDIR, This product creates system specific directory [DECSERVER].
%CREATE-I-EXISTS, VMI$SPECIFIC:[DECSERVER] already exists

Your installation is now complete.  After exiting from VMSINSTAL:

1. Add the following line to your system startup file,
   SYS$MANAGER:SYSTARTUP_V5.COM:

        $ @SYS$STARTUP:DSV$STARTUP.COM

   This procedure includes the SYS$COMMON:[DECSERVER] directory
   specification in the MOM$LOAD or MOP$LOAD logical name search
   list, and loads all communications server information into the
   volatile MOP database.

   If you have other directories of MOP load images or dump files,
   be sure to place the customized DEFINE/SYSTEM commands for
   MOM$LOAD, MOP$LOAD, and/or MOP$DUMP ahead of the execution of
   DSV$STARTUP.COM in the system startup file.

2. Configure the server into your host's database.

   Execute the command procedure called DSV$CONFIGURE.COM.  This
   command procedure is in the SYS$COMMON:[DECSERVER] directory.
   If you have already executed this procedure from previous
   installations, you only need to configure additional units.
   All previously defined units will still be configured.
```

```
The Installation Verification Procedure (IVP) for the MUXserver
can be found in SYS$TEST and may be run at any time by executing
the command procedure MS380$IVP.COM.
```

13. If you had earlier replied to the effect that you wanted your existing DSVCONFIG.DAT file converted (see Step 9 above) a display of system details follows, in a format such as this:

```
%MS380-I-IMPORT, importing old DSVCONFIG.DAT database - please wait
%DSV-I-IDENT, executing DSV$CONFIGURE version V1.0-007
-DSV-I-HELP, type ? at any time for help

Node Volatile Characteristics as of 12-JUL-1993 12:36:32

Remote node =   1.739 (EMULAT)

Service circuit          = SVA-0
Service password         = 0000000000000000
Hardware address         = 08-00-2B-24-F5-06
Load file                = MOM$LOAD:MS3801ENG.SYS
Dump file                = MOM$LOAD:MS8EMULAT.DMP
```

14. A further series of messages indicates the progress of installation, where the appearance of .SYS file references vary with the choices you have made for MUXserver 90, 320 and 380 installation, thus:

```
%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target directories...

Beginning installation verification procedure for MUXserver 90/320/380 V2.0.

Successful creation of SYS$COMMON:[DECSERVER] directory
Successful installation of SYS$COMMON:[DECSERVER]MS3801ENG.SYS
Successful installation of SYS$COMMON:[DECSERVER]MS3201ENG.SYS
Successful installation of SYS$COMMON:[DECSERVER]MS3901ENG.SYS
Successful installation of SYS$COMMON:[DECSERVER]DSV$CONFIGURE.COM
Successful installation of SYS$COMMON:[SYS$STARTUP]DSV$STARTUP.COM
Successful installation of SYS$COMMON:[DECSERVER]MS_V20_DEFAULTS.COM
Successful installation of SYS$COMMON:[DECSERVER]TSM$MS_V20_GET_CHAR.COM
Successful installation of SYS$COMMON:[SYSTEST]MS380$IVP.COM
*****************************************************************
*                                                               *
*            MUXserver 90/320/380 V2.0 Installation Verified    *
*                                                               *
*****************************************************************

        Installation of MS380 V2.0 completed at 12:36

        VMSINSTAL procedure done at 12:46
```

2.5 Installing onto Alternate OpenVMS Load Hosts

Digital recommends that you establish alternate OpenVMS load hosts for each server.

As with the original load host, an alternate load host must be a DECnet Phase IV or DECnet/OSI Phase V system. To serve as an alternate load host, a system must also have the distribution software installed, and it must have entries for one or more servers in its node database.

If the original load host is unavailable for downline loading the server image, any alternate load host can load the server instead. In addition, alternate load hosts can receive upline dumps from servers and can perform other maintenance functions.

2.5.1 Installing onto Single Systems

To install the server distribution software onto an alternate OpenVMS load host that is not a member of a VMScluster, either:

- Load the distribution materials into the appropriate device of the new load host and repeat the installation procedure detailed in Section 2.4, or
- Copy the distribution files from the original load host to a new load host.

2.5.2 Installing onto VMSclusters

To install the server distribution software onto an alternate load host that is a member of a VMScluster, install the software onto one cluster member and:

1. Log into a privileged (system) account on one of the other members of the cluster
2. Edit the system start-up procedure so that it defines the logical, MOM$LOAD (DECnet Phase IV) or MOP$LOAD (DECnet/OSI Phase V) as a search string with a value equal to the current search string, plus the added element SYS$COMMON:[DECSERVER]. For example:

   ```
   $ DEFINE/SYSTEM/EXEC/NAME_ATTRIBUTE=NO_ALIAS/NOLOG MOM$LOAD-
     current-search-string, SYS$COMMON:[DECSERVER] Return
   ```

3. Include the above command in the node's system start-up procedure, SYS$MANAGER:SYSTARTUP_V5.COM, and also add the command line:

   ```
   $ @SYS$STARTUP:DSV$STARTUP.COM
   ```

   to this start-up file.

4. If you want to have installation take full effect, you will need to either wait until your system is re-booted or to separately activate your (revised) system start-up procedure, with the command:

   $ **@SYS$MANAGER:SYSSTARTUP_V5** Return

2.5.3 Installing onto Other Operating Systems

To install the server distribution software onto another operating system follow the instructions in the *MUXserver Software Installation Guide* for that operating system.

2.6 Installation Verification Procedure

The MUXserver Installation Verification Procedure (IVP) can be executed at any time by entering the command:

$ **@SYS$TEST:MS380$IVP** Return

If the MUXserver software has been installed the IVP output will be:

```
Beginning installation verification procedure for MUXserver 90/320/380 V2.0.

Successfully located SYS$COMMON:[DECSERVER] directory
Successfully located SYS$COMMON:[DECSERVER]MS3x01ENG.SYS
Successfully located SYS$COMMON:[DECSERVER]DSV$CONFIGURE.COM
Successfully located SYS$COMMON:[SYS$STARTUP]DSV$STARTUP.COM
Successfully located SYS$COMMON:[DECSERVER]MS_V20_DEFAULTS.COM
Successfully located SYS$COMMON:[DECSERVER]TSM$MS_V20_GET_CHAR.COM

************************************************************************
*                                                                      *
*            MUXserver 90/320/380 V2.0 Installation Verified           *
*                                                                      *
************************************************************************
```

3

Configuring the Load Host Node Database

This chapter describes the procedures for configuring a load host node database to support a specific MUXserver Network. In order to complete these procedures, you will require details from the MUXserver Network Identification Card, which should have been recorded on the card by the person who installed the MUXserver hardware.

3.1 DSV$CONFIGURE

DSV$CONFIGURE is a command procedure that runs on a DECnet Phase IV OpenVMS load host or on a DECnet/OSI OpenVMS load host. This procedure allows you to:

- Maintain configuration information about the MUXserver as well as other DECservers and Access servers.
- Modify the local MOP (Maintenance Operation Protocol) client configuration.
- Access the remote console port of the MUXserver.

Digital provides DSV$CONFIGURE as part of the MUXserver software.

Note

If you are using the optional Terminal Server Manager (TSM) software, you must manage its database as detailed in the Terminal Server Manager Installation and User Manual.

3.1.1 Backward Compatibility of DSV$CONFIGURE

DSV$CONFIGURE supports both DECnet Phase IV and DECnet/OSI Phase V. Upon installation, DSV$CONFIGURE automatically converts databases created by DSVCONFIG to the data format required by DSV$CONFIGURE.

3.1.2 Executing DSV$CONFIGURE

The procedure DSV$CONFIGURE.COM is located in the directory:

```
SYS$COMMON:[DECSERVER]
```

You execute this procedure as you would any other DCL procedure, as shown below:

```
$ @SYS$COMMON:[DECSERVER]DSV$CONFIGURE  Return
```

You may find it useful to define a symbol for this procedure in your LOGIN.COM file:

```
$ DSV == "@SYS$COMMON:[DECSERVER]DSV$CONFIGURE"
```

If you define the symbol DSV as shown above, you can start DSV$CONFIGURE as shown in Example 3–1. This example also shows how to use HELP to display a list of DSV$CONFIGURE commands. The remainder of this section explains each command shown.

Example 3–1 Starting DSV$CONFIGURE and Displaying Help

```
$ DSV
%DSV-I-IDENT, executing DSV$CONFIGURE version x.x.x-nnn
-DSV-I_HELP, type ? any time for help

DSV> HELP

 ADD      - Add a server to the system
 MODIFY   - Modify an existing server's information
 SET      - Synonym for MODIFY
 DELETE   - Remove a comm. server from the system
 LIST     - Display information about one or all servers
 SHOW     - Synonym for LIST
 CONNECT  - Connect to a server via remote console
 USE      - Synonym for connect
 HELP     - Displays summary of valid commands
 EXIT     - Exit this procedure
```

3.1.3 The ADD command

To add a server to the system, you enter a command in the following format:

ADD [SERVER] [*server-name*]

where:

SERVER	Is an optional keyword as in all DSV$CONFIGURE commands.
server-name	Is an optional way to specify the name. If you do not specify the name on the command line, DSV$CONFIGURE prompts you for it.

After you enter the ADD commands, DSV$CONFIGURE displays a series of prompts. Some prompts display with defaults specified in square brackets. The values of the defaults are based on the running system. The form of responses in some cases depends on the system being installed.

For example, the Server Type for a MUXserver 380 is given in the form "MS380", and other types are given as "MS320" (MUXserver 320) and "MS90" (MUXserver 90).

Example 3–2 shows the ADD command on a DECnet/OSI system. In this example, the symbol Return without a value signals the selection of the default value.

Example 3–2 Example of the DSV$CONFIGURE ADD Command

```
DSV> ADD SERVER Return
_Server Name:  SHRIMP Return
_Ethernet Address: 08-00-2B-26-AE-32 Return
_Server Type: MS380 Return
_Service Circuit: [SVA-0]: Return
_Maintenance Password [none]: FEDCBA
_Dump File [MOP$DUMP:MS3SHRIMP.DMP]: Return
_Load Image [MOP$LOAD:MS3801ENG.SYS]: Return
```

After you enter the ADD command, you can display information about the MOP client with the

- DSV$CONFIGURE LIST command
- NCL SHOW command for DECnet/OSI Phase V
- NCP SHOW NODE command for DECnet Phase IV

If you use DECnet Phase IV, the required DECnet address prompt has a default of the first unused address in area 13.

3.1.4 The MODIFY and SET Commands

The MODIFY and SET commands operate in a manner similar to the ADD command. These commands provide defaults for each prompt. The defaults are the existing values for the server.

The syntax, prompts and displays for the SET and MODIFY commands are similar to those for the ADD command.

3.1.5 The DELETE command

The DELETE command removes a MUXserver. This command clears both the permanent configuration data stored on disk and the operational data stored in memory.

The syntax of the DELETE command is identical to that for the ADD command.

Example 3–3 shows the DELETE command. This example omits the optional SERVER keyword.

In Example 3–3, NCL on DECnet/OSI Phase V displays the message

```
NODE 0 MOP Client SHRIMP
```

NCP displays a similar message on a DECnet Phase IV system.

Example 3–3 The DELETE Command for DSV$CONFIGURE

```
DSV> DELETE SHRIMP
Server:     SHRIMP              Circuit:            SVA-0
Address:    08-00-2B-26-AE-32   Maint. Password:    FEDCBA
Type:       MS380
Dump File:  MOP$DUMP:MS3SHRIMP.DMP
Image File: MOP$LOAD:MS3801ENG.SYS
Are you SURE you want to delete this server??? [No] : YES

Node 0 MOP Client SHRIMP
at 1993-10-26-13:31:29.378-05:0010.176
```

3.1.6 The LIST and SHOW Commands

The LIST and SHOW commands display information about a MUXserver. The syntax of the LIST command is identical to that for the ADD command with one exception: *server-name* may be a wildcard character.

Example 3–4 shows the data that the LIST and SHOW commands display.

In Example 3–4, the DECnet address would also display if this were a DECnet Phase IV node.

Example 3–4 The LIST Command for DSV$CONFIGURE

```
DSV> LIST SERVER
_Server Name: SHRIMP

Server:         SHRIMP              Circuit:            SVA-0
Address:        08-00-2B-26-AE-32   Maint. Password:    FEDCBA
Type:           MS380
Dump File:      MOP$DUMP:MS3SHRIMP.DMP
Image File:     MOP$LOAD:MS3801ENG.SYS
```

3.1.7 The CONNECT and USE Commands

The CONNECT and USE commands enable you to communicate with the remote console port on the MUXserver. DSV$CONFIGURE uses the console carrier function, CCR to make the connection. Once DSV$CONFIGURE makes the connection, you can use almost any MUXserver command supported at any physical port.

Example 3–5 shows how to use CCR and DSV$CONFIGURE to connect to a remote console port from a DECnet/OSI system.

Example 3–6 shows how to use CCR and DSV$CONFIGURE to connect to a remote console port from a DECnet Phase IV system. From a user's perspective, the only difference between DECnet/OSI and DECnet Phase IV is the disconnect character.

- DECnet/OSI Phase V uses CTRL/\ (that is, Control-Backslash).
- DECnet Phase IV uses CTRL/D

Example 3–5 The CONNECT Command for DSV$CONFIGURE on a DECnet /OSI System

```
DSV> USE SHRIMP
%CCR-I-CONNEST, connection established to remote system 08-00-2B-26-AE-32
Press CTRL/\ to disconnect, CTRL/] to send break

# ACCESS (not echoed)

MUXserver 380 Terminal Server V2.0 (BL9) - LAT V5.2

(c) Copyright 1993, Digital Equipment Corporation - All Rights Reserved

Please type HELP if you need assistance

Enter username> Dave

Local> show user
Port            Username         Status         Service
3                                Connected
10              User 10          Connected
11              TELNET           Local Node

Local> CTRL/\
```

Example 3–6 The CONNECT Command for DSV$CONFIGURE on a DECnet Phase IV System

```
DSV> USE SHRIMP

Console connected (press CTRL/D when finished)
# ACCESS

MUXserver 380 Terminal Server V2.0 (BL9) - LAT V5.2

(c) Copyright 1993, Digital Equipment Corporation - All Rights Reserved

Please type HELP if you need assistance

Enter username> Dave

Local> CTRL/D
```

3.1.8 Context-Sensitive Help for DSV$CONFIGURE

DSV$CONFIGURE provides context-sensitive help. At any prompt other than the Local> prompt after a CONNECT/USE command, type a question mark (?) for an explanation.

4
Verifying the Installation

This chapter describes the verification of a MUXserver software installation. Verification includes:

- Verifying the load host installation by downline loading the server image.
- Verifying the MUXserver as a system after it is loaded, by testing a number of representative server commands at an interactive terminal connected to the MUXserver.

The process of verifying the load host installation involves downline loading the server image to a MUXserver and then reading the DECnet event logging messages. This confirms that the new load host:

- Has the appropriate files in the correct directory,
- Has a correct entry in its node database for the server, and
- Can successfully downline load the server image to the MUXserver.

The process of verifying the total MUXserver system installation (the hardware unit with the correct software loaded and running) involves the testing of a number of representative server commands at an interactive terminal connected to a console port. This confirms that:

- The correct version of the software has been loaded,
- The MUXserver hardware operates with the new software, and
- The new software is running successfully.

4.1 Verifying the Load Host Installation

4.1.1 The LOAD NODE and LOAD SERVER Commands

The LOAD NODE command of NCP and the LOAD SERVER command of NCL are the preferred methods of downline loading a server image for verification purposes. These methods permit the testing of the software installation from a specific load host. Other methods of downline loading are described in the *MUXserver Network Reference Manual*.

The LOAD NODE and LOAD SERVER commands each allow:

- A load host to be specified. The load host which performs the downline load is the OpenVMS system from which the command is being given.
- DECnet event logging messages to be read. These messages confirm that the specified load host performed the downline load successfully.

Depending on network or system requirements, a new server image may be downline loaded to a new MUXserver or to an existing unit that is currently operating on the network.

4.1.2 Loading a New MUXserver

When a MUXserver is new it has no operating software in it until the initial downline load, which occurs automatically upon MUXserver startup.

When the hardware installer powers up a unit, the MUXserver automatically requests a load of its image from any available load host. An established load host recognizes the request and downline-loads the server image.

The hardware installer can then verify the hardware installation with the diagnostic light emitting diodes on the MUXserver itself by referring to details provided in the relevant *MUXserver Hardware Installation Manual*. If the server image cannot be properly downline-loaded as soon as the MUXserver is powered up, this is indicated by the diagnostic displays. Therefore, coordination between software and hardware installation is important.

Note that this automatic downline load verifies the hardware but does not verify the load host installation.

4.1.3 Loading an Existing MUXserver

When an operating MUXserver is loaded, all sessions are disconnected. If a MUXserver is about to be loaded with a new image, coordination with the network manager is important. Depending on users' requirements, it may be best to delay installation verification and to perform downline loading when most users are off-duty.

Ask the network manager of an existing MUXserver to alert the interactive users on the server of the planned shutdown for reloading. The *MUXserver Network Reference Manual* describes the issues involved in shutting down the server.

4.1.4 Preparing for the LOAD Command

To prepare for downline loading:

1. Check the DECnet node name or DECnet node address of the MUXserver. To execute the LOAD command you need to know one of these node identifiers.

   If you do not remember this information from running the DSV$CONFIGURE procedure (refer to Chapter 3), run the procedure again, and select the LIST option from the menu. LIST displays the DECnet node name and DECnet node address of all the servers you defined in this load host node database.

2. Determine the MUXserver's DECnet service password, if there is one, from the network manager (the manager may know it as the maintenance password). For a previously configured server you may need to specify this password on the LOAD NODE command line.

3. Enable DECnet event logging. Event logging messages are generated.. The example below comes from a system with NCP available:

```
$ NCP Return
NCP> SET LOGGING CONSOLE EVENT 0.3,7 Return
NCP> SET LOGGING CONSOLE STATE ON Return
NCP> SET LOGGING MONITOR STATE ON Return
```

Note

All other commands needed for downline loading, such as those that set the Ethernet line and identify and enable the service circuit, are part of DSV$CONFIGURE and are executed when you run that procedure (see Chapter 3).

4.1.5 Warning Users before Loading

To reload an installed and running MUXserver during normal working hours, either you (if you know the password) or the network manager can use the server interface to issue the privileged BROADCAST ALL command to warn server users.

A warning can also be broadcast from a remote console port.

Issue the BROADCAST ALL command at the server prompt (Local>) to send a message to all ports on the MUXserver network. A message can contain up to 115 characters.

Note that the reception of broadcasts can be disabled on ports and some users may not receive a message.

A typical BROADCAST ALL command is:

```
Local> SET PRIV Return
Password> system Return (not echoed)
Local> ATTACH ALL Return
Local> BROADCAST ALL "The server will be reloaded in 3 minutes." Return
```

4.1.6 Issuing the LOAD Command

After warning interactive users of an operating MUXserver network and after enabling event logging, issue the LOAD NODE command at a terminal connected to your OpenVMS load host. On the command line enter either the DECnet node name or the DECnet node number.

The following example commands load an existing MUXserver named SHRIMP with a node address of 13.204 on a system using NCP.

```
$ NCP Return
NCP> LOAD NODE SHRIMP Return
```

or

```
NCP> LOAD NODE 13.204 Return
```

If the network manager previously set a server maintenance password, include the SERVICE PASSWORD keywords and specify this password as the DECnet service password on the command line. For example:

```
NCP> LOAD NODE SHRIMP SERVICE PASSWORD OF23 Return
```

To exit from NCP, type EXIT:

```
NCP> EXIT Return
$
```

4.1.7 Checking DECnet Event Logging

After executing the LOAD command check the DECnet event logging messages that report the load to confirm that it was successful. Read the event logging messages at your system's operator's console. They identify your OpenVMS system as the node that generated the event.

If no errors are reported you should assume that the downline load was successful and that verification of the new load host has been completed.

If the event logging messages report errors, contact the MUXserver hardware installer and check that the hardware is working correctly. If it is, the problem is probably with the load host. Check:

- The node database, especially the Ethernet address you entered when you defined the test server,
- That the server image is in the appropriate directory, and
- That DECnet is running.

Enter the LOAD command again.

Note

When event logging is set up on a DECnet node, you can specify the destination (called the sink) of the messages. You should set up one DECnet sink node to receive all the logging events associated with downline loading so that all load request status information is available at one node.

4.1.8 Loading After Hours

Downline loading can be performed after hours to minimize disruption to the nodes affected by the MUXserver. To do this, include the LOAD command in a batch job to be run after hours.

4.2 Verifying the MUXserver System Installation

Complete the verification of the MUXserver system installation using a number of representative server commands at an interactive terminal attached to the MUXserver's console port, as follows:

1. Press Return a number of times

   The following message and prompt appear:

   ```
   MUXserver 380 Terminal Server V2.0 (BL9) - LAT V5.2

   Please type HELP if you need assistance

   Enter username>
   ```

2. Read the identification message and check that the correct version of the MUXserver image was downline loaded. If the message is not displayed, the problem could be:

   - With the load host,
   - With the terminal, or
   - That the incorrect software was downline loaded.

3. Enter your user name (any string of 1 through 16 characters that identifies you) and press Return. The port should now enter local mode, and the (Local>) prompt should appear:

   ```
   Enter username> SWINSTALLER Return
   Local>
   ```

4. Use the TEST PORT command to check that the terminal is receiving valid character data. On the command line, specify the number of lines and the number of columns you would like displayed. For example, the following command will display five lines of 80 characters each:

   ```
   Local> TEST PORT COUNT 5 WIDTH 80 Return
   ```

   You can interrupt this test by pressing any key.

5. Issue the SHOW PORT command to display the characteristics of your port and their values:

   ```
   Local>SHOW PORT Return
   ```

   A port characteristics display should appear.

6. Use the SHOW SERVICES command to show what services are available to you. The following server command produces a list of services and service announcements:

   ```
   Local>SHOW SERVICES Return
   ```

7. Select an available service that you are authorized to use and use the CONNECT command to verify that the MUXserver can logically connect your terminal to that service.

   On the command line, specify the service name to which you wish to connect. The following example connects your terminal to an OpenVMS system, named OPNVMS:

   ```
   Local> CONNECT OPNVMS Return
   ```

   When the MUXserver successfully connects your terminal to the specified service, you should no longer see the local prompt; you should be communicating with the service, in this example, your own OpenVMS system.

8. Enter several commands to verify the ability of the MUXserver to exchange data with the service. For example, in this case, you could login then enter SHOW TIME and SHOW USERS.

9. Press Ctrl/BREAK or log out from the service to return to local mode.

10. Log out from the MUXserver then log out the terminal from the unit:

    ```
    Local> LOGOUT Return
    ```

Refer any difficulties with MUXserver installation verification to the relevant network manager.

If verification has been completed successfully, the test server is operating correctly and you should report the successful load host installation and MUXserver installation verification to the network manager.

If this installation was a software upgrade, either you or the network manager must now reload all existing servers.

A
MUXserver Distribution Files

Table A–1 lists the files included in the MUXserver distribution kit:

Table A–1 MUXserver Distribution Kit Files

File Name	Description
KITINSTAL.COM	Command file used by VMSINSTAL during installation
DSV$CONFIGURE.COM	Configuration procedure
MS380$*nnn*.RELEASE_NOTES	MUXserver release notes, *nnn*=version number
MS380_V20_DEFAULTS.COM	TSM command file to set a MUXserver to factory defaults
MS3801ENG.SYS	MUXserver 380 system image
MS3201ENG.SYS	MUXserver 320 system image
MS3901ENG.SYS	MUXserver 90 system image
RFC1213.TXT	SNMP definitions for MIB-II
RFC1316.TXT	SNMP definitions for Character MIB
RFC1317.TXT	SNMP definitions for RS-232-like MIB
RFC1381.TXT	SNMP definitions for LAPB MIB
DECMUX_MIB.TXT	SNMP definitions for DECmux MIB
MS380$IVP.COM	Installation verification procedure
TSM$MS_V2_GET_CHAR.COM	File used by the TSM software

Glossary

This glossary defines terms used in the MUXserver Software Installation Guide for the OpenVMS operating system.

Asynchronous

A name for a method of communication in which each event occurs in with no relation to a timing signal. See also *synchronous*.

CCR

A function that provides access to the remote console subsystem of a network system on a LAN.

Console Port

A DEC423 port used to connect a terminal.

Ethernet

A Xerox trade mark for a type of local area network based on carrier-sense multiple access/collision detection (CSMA/CD).

IVP

Installation Verification Procedure. A means of checking whether an installation has worked.

LAT

Local Area Transport - Digital's name for the Ethernet protocol used by the MUXserver for device connections.

Local Area Network

A network spanning a limited geographic area, such as a building or group of buildings, using a high speed data bus.

MODEM

A contraction of MOdulator DEModulator. A modem provides an interface between a digital data stream and an analog data stream.

Network Manager

The person responsible for all components of a network in a particular geographic area.

Node

An intelligent device on a network.

OpenVMS

One of Digital's operating systems for VAX and Alpha computers.

Port

The actual physical connection between equipment and, for example, a serial communications line.

Service

A resource, such as a computer.

Server

A hardware and/or software device which provides many users with access to a system.

Synchronous

An adjectives describing a communication method in which each event occurs in relation to a timing signal. See also *Asynchronous*.

Terminal

An input/output computer peripheral device that has a keyboard and video screen or printer.

Terminal Server

An active device, such as a MUXserver network, used to attach terminals to a host system through a network.

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